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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/731,637	12/07/2000	Frank Cordiale		9974

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EXAMINER

JONES, JUDSON

ART UNIT PAPER NUMBER

2834

DATE MAILED: 01/17/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/731,637

Applicant(s)

CORDIALE, FRANK

Examiner

Judson H. Jones

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 16 December 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 13 is/are allowed.
- 6) ☒ Claim(s) 1-12 and 14-16 is/are rejected.
- 7) ☒ Claim(s) 17 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

### Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_ 6) ☐ Other: \_\_\_\_\_

### **DETAILED ACTION**

The indicated allowability of claims 3-5, 7-12 and 14-16 is withdrawn in view of the newly discovered reference(s) to Zimmermann (French reference 2 666 627). Rejections based on the newly cited reference(s) follow.

#### ***Claim Objections***

Claim 7 is objected to because of the following informalities: There is no antecedent basis for "said frame" in line 1 of claim 7. Claim 7 depends on claim 2 where a cylindrical framework is mentioned. If "said frame" refers back to the cylindrical framework, then consistent language should be used to refer to this element. Appropriate correction is required.

#### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 15 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The phrase "without external actuation" is unclear. Under the broadest interpretation of the phrase, applying power to the coil is an external actuation.

#### ***Claim Rejections - 35 USC § 103***

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 1, 4 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zimmermann (French reference 2 666 627) in view of Mittel and Lew et al. The French reference discloses a prime mover comprising a cylindrical framework with a plurality of copper

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filaments 14, 20, 21, 22, a power source and at least one switch. While the power source and switch are not explicitly shown in the drawings, they are necessary for the proper functioning of the prime mover. The French reference does not disclose a steel piston of spherical shape but instead discloses cylindrical pistons made from a magnetizable material and having a slight arc as shown in figure 1. However Mittal discloses spherical pistons made from a magnetizable metal in column 2 line 67 to column 3 line 7. Those spherical pistons allow the track of the balls to vary in from uniformly circular as shown in figure 1 of the French reference to a combination of curved and straight as shown in Mittal figure 1. Since the French reference and Mittal are both from the same field of endeavor, it would have been obvious at the time the invention was made for one of ordinary skill in the art to have utilized spherical pistons in the device of the French reference in order to allow more variation in the track of the prime mover. In regard to the material of the pistons, Lew et al. discloses in column 3 lines 22-28 that the pistons can be made entirely from carbon steel or from another material but have a carbon steel bar or permanent magnet inside. Since Lew et al. and the French reference as modified by Mittal are both from the same field of endeavor, it would have been obvious at the time the invention was made for one of ordinary skill in the art to have utilized steel pistons in order to make the pistons strong and thus increase the durability and life of the prime mover. It is also noted that magnetizable materials as mentioned in the French reference and magnetizable metals as mentioned in Mittal include steel.

In regard to claim 4, see the French reference figure 2.

In regard to claim 5, see Mittal column 3 lines 11-15 and column 2 lines 36-42. Since the French reference and Mittal are both from the same field of endeavor, it would have been

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obvious at the time the invention was made for one of ordinary skill in the art to have utilized a non-magnetic material such as stainless steel or molded plastic for the cylinder in order to allow the magnetic flux from the coils to move the piston instead of being dissipated in a magnetic cylinder.

Claims 2, 3, 10 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sasso in view of Takara. Sasso discloses a prime mover having a cylindrical framework wound with at least two copper filaments 58, 60 as shown in figure 3, a power source as shown in figure 5 (see the 72 volt battery in the lower left hand of the drawing) and at least one switch as shown in figure 5 (see the distributor 112 in the upper right hand of the drawing) but does not disclose a steel piston or a permanent magnetic source for accelerating a reciprocal motion of the piston. Sasso in column 3 lines 39-41 and column 6 lines 7-9 teaches the use of a ferromagnetic piston (which he calls a plunger). However Takara teaches the use of a steel piston in column 6 lines 44-46. Since Takara and Sasso are both from the same field of endeavor, it would have been obvious at the time the invention was made for one of ordinary skill in the art to have utilized a steel piston in order to make the piston stronger and thus increase the durability of the motor. In regard to using a permanent magnet source in addition to the coil, see Takara column 6 lines 59-64 and column 8 line 65 to column 9 line 1 and see element 7 in figure 1. Since Takara and Sasso are both from the same field of endeavor, it would have been obvious at the time the invention was made for one of ordinary skill in the art to have utilized a permanent magnet for accelerating a reciprocal motion of a piston and to provide a starting position for the motor through a magnetic bias means.

In regard to claim 10, see Sasso figure 1.

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In regard to claim 11, see Sasso column 8 lines 54-58.

Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over the French reference in view of Mittal and De Dionigi. The French reference as modified by Mittal discloses the prime mover but does not disclose a cylinder made from brass. However De Dionigi teaches in column 2 lines 28-33 that stainless steel and brass are both materials that can be used in constructing cylinders. Since De Dionigi and the French reference as modified by Mittal are both from the same field of endeavor, it would have been obvious at the time the invention was made for one of ordinary skill in the art to have utilized brass for the cylinder of the prime mover in order to reduce the cost of the device.

Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sasso in view of Takara as applied to claim 2 and further in view of De Dionigi and Trago et al. Sasso as modified by Takara discloses the prime mover but does not disclose a frame made from high temperature resistant polymer. See Sasso column 6 lines 32-37 where Sasso mentions that sleeves (which are the equivalent of Applicant's framework or frame) should be made of a non-magnetic material and suggests stainless steel. However De Dionigi teaches in column 2 lines 24-30 the alternatives of copper, plastic material and brass along with stainless steel. Since De Dionigi and Sasso as modified by Takara are both from the same field of endeavor, it would have been obvious at the time the invention was made for one of ordinary skill in the art to have utilized a plastic frame in order to reduce the weight of the device to make the device easier to transport and install. Trago et al. is cited to explain what is meant by "plastic." See Trago et al. column 12 line 49 to column 13 line 4. Since Trago et al. and De Dionigi are both from the same field of endeavor, it would have been obvious at the time the invention was made for one of

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ordinary skill in the art to have realized that polymers are plastic materials. In regard to high temperature resistant polymers, see Trago et al. column 13 lines 18 and 19. The heat stabilizers mentioned are what gives a polymer high temperature resistance. Since Trago et al. and Sasso as modified by Takara and De Dionigi are both from the same field of endeavor, it would have been obvious at the time the invention was made for one of ordinary skill in the art to have utilized heat stabilizers in the plastic/polymer frame in order to increase the durability and to thus extend the life of the prime mover. It is also noted that plastic cylinders are cheaper to manufacture than ones made from stainless steel, which provides another reason for choosing the plastic material.

Claims 8 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sasso in view of Takara as applied to claim 2 and further in view of Gifford and Ricouard et al. Sasso as modified by Takara discloses the prime mover but does not disclose metal detection means for actuation. Sasso as described in column 8 lines 54-58 relies on a timing sequence for actuation while Takara uses a brush to contact a copper electrode as described in column 4 line 59 to column 5 line 3. However Gifford teaches in column 4 line 59 to column 5 line 6 that sensing the actual position of the piston is an alternative method and that a computer can be used to control actuation. Since Gifford and Sasso as modified by Takara are both from the same field of endeavor, it would have been obvious at the time the invention was made for one of ordinary skill in the art to have utilized sensing the actual position of the pistons and controlling actuation by a computer in order to make changes in the operation of the motor easier. Gifford suggests using magnetic position indicators or other convenient means. Hall effect sensors are one popular magnetic sensing means which operate by sensing magnetic fields. Ricouard et al. teaches a way to make Hall effect sensors operable to sense soft magnetic elements. Since Ricouard et al. and

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Sasso as modified by Takara and Gifford are both from the same field of endeavor, it would have been obvious at the time the invention was made for one of ordinary skill in the art to have utilized a Hall effect sensor means to sense the position of the metal pistons in order to increase the precision and thus the efficiency of the prime mover and also to allow for easy changes to the operation of the device.

Claims 12 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sasso in view of Takara as applied to claim 2 and further in view of Simpson et al. Sasso as modified by Takara discloses the prime mover with a piston and cylinder but does not disclose the prime mover operating as a pump. However Simpson et al. teaches that a piston driven linearly by a coil can be used as a pump in figure 2. Since Simpson et al. and Sasso as modified by Takara are both from the same field of endeavor, it would have been obvious at the time the invention was made for one of ordinary skill in the art to have utilized the reciprocating linear motor of Sasso as modified by Takara as a pump to provide another market for the motor.

Claims 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sasso in view of Takara as applied to claim 2 and further in view of Massie and Eno et al. Sasso as modified by Takara discloses the prime mover with a piston and cylinder but does not disclose a rare earth magnet used for biasing the piston to permit a start without external actuation. However Massie teaches using a bias magnet to get the movable part of a motor to stop at a desired position as shown in figure 1. See element 6 in the drawing and column 2 lines 64-67. Since Massie and Sasso as modified by Takara are both from the same field of endeavor, it would have been obvious at the time the invention was made for one of ordinary skill in the art to have utilized a bias magnet in a prime mover to control where the motor stops. Massie does not specify the type



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of magnet used, but Eno et al. states in column 2 lines 24-26 that rare earth magnets are powerful, thus allowing a reduction of mass in the magnet for the same size flux density. Since Eno et al. and Sasso as modified by Takara and Massie are both from the same field of endeavor, it would have been obvious at the time the invention was made for one of ordinary skill in the art to have utilized a rare earth magnet for the bias magnet in order to reduce the mass of the prime mover and to thus make it easier to transport and assemble.

Claims 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sasso in view of Takara as applied to claim 2 and further in view of Lloyd et al. Sasso as modified by Takara discloses the prime mover with a piston and cylinder with two windings but does not disclose the two windings wound in opposite directions. However Lloyd et al. teaches in column 4 lines 6-10 that winding two coils in opposing directions has the same effect as reversing the polarity of the current to the windings. Since Lloyd et al. and Sasso as modified by Takara are both from the same field of endeavor, it would have been obvious at the time the invention was made for one of ordinary skill in the art to have utilized windings wound in opposite directions to avoid the need for reversing the current to the windings and to thus reduce the cost of the power supply.

***Allowable Subject Matter***

Claim 13 is allowed.

Claim 17 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

The prior art of record does not disclose or teach a steel piston reciprocating inside a cylindrical


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framework where the piston exits the cylinder when an exit coil is not energized as recited in claim 13. The prior art of record does not disclose or teach a prime mover with a spherical steel piston where the piston reciprocates as recited in claim 17. While Mittel discloses a spherical steel piston in his device, the piston moves in a continuous loop instead of reciprocating. No reason has been found for utilizing Mittel's spherical steel piston in the reciprocating devices of the prior art.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Judson H Jones whose telephone number is 703-308-0115. The examiner can normally be reached on 8-4:30 M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nestor Ramirez can be reached on 703-308-1371. The fax phone numbers for the organization where this application or proceeding is assigned are 703-305-3431 for regular communications and 703-305-3432 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

JHJ   
January 11, 2003

